

Applying creative thinking skills in teaching math at primary school stage

Yosef Abd Algani,
Israel

Abstract.

Creative thinking nowadays is seen as the best promoter for enhancing teaching and educational achievements. Likewise, it makes students consider and evaluate their own particular thinking and direct on issues related to prosperity preparing, physical guideline, and home budgetary issues. Also makes them settle on sensible and strong decisions about issues related to individual and gathering flourishing, test and make a move (only and in general) to address social, fiscal, and political variations, and appreciate the part and enormity of the advancement culture and its effect on the continuity of our lives and our group. The top priority is the true objective to attract the innovative thinking. The educator needs to be a facilitator to take into account talk and invigorate a more freed perspective. Furthermore, help understanding that thinking imaginatively does not mainly give right answer, but instead at times shut in more request or differentiating appraisals of the subject (Halx&Reybold, 2005; Arend, 2009).

The instructor's part as facilitator likewise empowers an associate audit process, even in the most youthful of kids, and causes understudies to learn proper reactions to clashing assessments and feelings (Henderson-Hurley and Hurley, 2013; Tsai et al., 2013).

The researcher inferred that an instructor needs to possibly be imaginative, to some extent. Inventive instructing must be a piece of a classroom if the instructor is directing a keen person. An educator who is sufficiently inventive to be part of the imaginative classroom can configuration energizing new lessons, persuade the correct classroom condition required for understudies to grandstand their creative personalities. Regularly, it has been seen that imaginative instructing barely empowers any sort of inventive thoughts in understudies and in this way, the whole thought of an innovative classroom falls flat! Along these lines, it does rely upon the educator and nature of the place of instructing to give those youthful brains a chance to begin flying with brilliant hues.

Keywords: Creative thinking, Teaching, Math, primary school

The significance of the study

Education is a key factor in the welfare of kids, it largely affects a nation's economy and the general soundness of its natives. Training goes far and put resources into instruction to stand out among the essential routes with which we can enhance our reality.

The first few years of the infant's life is assumed to create and ingest their circumscription. These encounters that youngsters have at a very early stage in their lives influence their advancement physically, cognitively, emotionally and socially. The best speculation to guarantee the future achievement of a kid is to put resources into the early years of their lives, through training. Youngsters build up the most beneficial when they are given conditions in which they can investigate their general surroundings, play with others, and figure out how to talk and tune in to others. Early neurological advancement even influence the way one may learn. Sometimes down the road if kids don't learn in their initial youth they may experience learning difficulties later on.

Additionally, this examination is fundamental, it shows another implimentation that was not overseen in past researchs. For instance, creative thinking is a gadgets to make imaginative thinking, which means that organizing instructive modules learning activities and arranging appropriate tasks for grade school staking shows the aptitude of innovative thinking in such essential stage. It sheds lights on apparatuses and approaches to empower inventive reasoning while at the same time showing math and helps Decision-Makers at the Ministry of Education to profoundly think about creative thinking in instructing process. Thus, the researcher uses the descriptive approach by exploring relevant studies on this theme to figure out the impact of using creating thinking on teaching maths at primary schools. Concluding that different procedures educators use to stimulate students and contribute to promoting their skills.

Creative thinking

Creative thinking is the capacity to comprehend an idea completely, taking in various sides of an issue or thought while not being influenced by the purposeful publicity or other fake strategies used to advance it." - Denise Selleck

Creative thinking is the disposition to think clearly and accurately in order to be fair." -Richard Paul

Creative thinking inquiry their own convictions and in addition those of others, detail all around contemplated contentions to help their convictions, perceive the likelihood of progress in their convictions and express their convictions in clear, intelligent dialect. Therefore, Cooper and Patten, 2-11)

Teaching Maths

Teaching is the sharing of teacher involvement in confronting an instructive need and tending to that need, where the need may be an answer for an issue or a chance to use innovation to impact data frameworks training. (Kruck, 2010)

Educating is a colossally troublesome activity that looks simple" Kruck, S.E. (2010), "Editor's Message." Journal of Information Systems Education, Vol. 21, No. 1, Spring 2010, p. 3.

Mathematics is a guide to speaking to and endeavoring to determine issue circumstances in all disciplines. It is an interdisciplinary device and dialect.

Numerical disclosures have come both from the endeavor to depict the characteristic world and from the want to touch base at a type of unpreventable truth from cautious reasoning."Dr.Lewis"

Essential Education is the underlying phase of instruction and has as its fundamental expect to make, build up and offer chances to all youngsters, paying little heed to age, sexual orientation or nation of beginning, to accomplish an adjusted subjective, enthusiastic and psychomotor improvement. Elementary education also called primary education, the first stage traditionally found in formal education, beginning at about age 5 to 7 and ending at about age 11 to 13 .(Cyprus Ministry of Education and Culture).

Research design

Methodology. The researcher will follow the descriptive approach based on recommendations of previous studies and observation to make the maximum benefits and give accurate results.

Research Question: What is the impact of using creative thinking in teaching math?

Literature Review. A key report by Ball (1993) strengthens this by featuring a few parts of information required for educating arithmetic. Ball's examination researched issues that emerged as she showed arithmetic in an elementary school. She articulated these issues regarding difficulties in instructing arithmetic. These difficulties were; speaking to the substance, regarding youngsters as scientific scholars, and making and utilizing the group. She states, "in science educating, making sense of intense and powerful approaches to speak to specific thoughts suggests... giving genuine thoughtfulness regarding both the arithmetic and kids. This is more effortlessly said than done" (p. 378). The estimation of her work is that it features the many-sided quality of the learning required for instructing science. She presumes that to show science adequately, educators need to know the substance of the arithmetic they are instructing and how to show it to the youngsters in their setting. Ball additionally recognizes this as "instructive substance information" for educating mathematics.

In Australia, Wilson and Thornton (2007) found that pre-benefit instructors needed a profound and associated content information of arithmetic with a specific end goal to be effective educators. They found that educators with low levels of scientific substance were hindered by their absence of information, as well as felt on edge about their capacity to show science in a viable way. This worry for low levels of numerical substance learning has additionally been noted by Hawera (2004) and Tobias (1994), as a hindrance to viable science educating. In like manner, others contend that it is scientific substance information that adds to an instructor's convictions, states of mind and personalities about showing science (Grootenboer, 2006; Prescott and Cavanagh, 2006; Scott, 2005; Walshaw, 2004; Zevenbergen, 2006).

Mathematics learning difficulties in primary education

Numerous students at all levels of training in creating nations have issues in learning arithmetic. The reasons for these troubles are numerous and colossal. Five of the various wide factors have all the earmarks of being extraordinary. To start with, a few understudies appear to be contrarily impacted by the generalization convictions held by numerous individuals that arithmetic is a troublesome subject (Heward, 1996). Second, for

various students, their issues seem to originate from unsuitable instructing and the resultant absence of the experience of progress (Mundia, 1996; 1998). Third, still for different understudies, their challenges appear to be connected to the systems utilized as a part of assessing science students (Somerset, 1987; Murray, 1996). Fourth, there are additionally understudies who lamentably may have a bona fide particular learning handicap in arithmetic (; Thornton et al., 1983; Hall, 1994; Mercer, 1997; Bos and Vaughn, 2002). Fifth, poor execution in science may likewise be credited to insufficient subsidizing of training which brings about less instructing/learning assets and low nature of training (Kelly; 1986; 1991).

The youngster depicted in the present triadic ponder (scratch named B) required the joint endeavors of an instructive therapist/school advisor, one of the kid's folks (referrer) and an extraordinary teacher, to fathom. Dettmer, Thurston, and Dyck (2002) talk about the feasibility and advantages of synergistic mediation procedure.

The essential point of all instruction is to make all youngsters by and by autonomous, socially capable, and financially or professional productive. In any case, arithmetic is a center of scholastic competency. A level of capability in fundamental science is extremely basic to adapt autonomously and adequately with regular living. Essential mathematics abilities incorporate number ideas, fundamental thinking, and learning of essential certainties, critical thinking and alike. Acing the aptitudes and methodologies important to take care of these issues is basic for working viable in the public arena. Huge quantities of understudies are always faced with issues that include science aptitudes as scientific critical thinking is a mind-boggling, recursive subjective movement including different intellectual procedures and two essential stages that expect a working comprehension of these procedures: issue portrayal and issue execution. Studies uncover that 5 to 10% of all school-age youngsters have some kind of genuine shortfall in science and that troubles in arithmetic are basic among kids with learning handicaps (Geary, 2003). Understudies with learning incapacities normally have shortfalls in consideration, memory, foundation information, vocabulary, dialect forms, and procedure information and utilize, visual-spatial handling, and self-control (Baker et al. 1995; Geary, 2003), which probably deleteriously affect at least one areas as science, perusing. In spite of the fact that science accomplishment has enhanced throughout the years, the accomplishment rates of understudies with learning incapacities specifically remain impressively lower than those for different understudies.

Subjective Development: Students with incapacities stuck in an unfortunate situation on account of deferrals in psychological advancement, which ruins learning and handling data (Gersten et al., 2005). This may prompt issues with the accompanying: Understanding connections between numbers (e.g., parts and decimals; expansion and subtraction; augmentation and division). Taking care of word issues. Understanding number frameworks. Utilizing viable tallying methodologies

Examples of creative strategies on teaching maths

Questions and Actions Procedure (Rivera, 1994): It enables understudies to utilize distinctive strides to dissect and tackle word issues. 2. TINS Strategy (Owen, 2003): The TINS technique enables understudies to utilizedistinctive strides to break down and take care of word issues. Table - 1: Questions and Actions Strategy (Rivera, 1994) Steps Questions Actions Read the Problems Are there words I don't know Do I know what each word implies? Do I have to rehash the issue? Are there number words? Underline words. Discover definitions. Rehash. Underline. Repeat the Problem What data is critical? What isn't data required? What is the issue inquiring? Underline. Cross out. Put in claim words. Create Plan What are the actualities? How might they be sorted out? What number of steps are there? What tasks will I utilize? Make a rundown. Create diagram. Utilize manipulative. Utilize littler numbers. Select a task. Process the Problem Did I find the right solution? Gauge. Check with the accomplice. Check with number cruncher. Look at the Results Have I addressed the inquiry? Does my answer appear to be sensible? Would I be able to repeat address/reply? Rehash question. Check question/reply. Compose a number sentence. Table - 2: TINS Strategy (Owen, 2003) Steps Explanation Thought Think about what you have to do to tackle this issue and circle the catchphrases. Data Circle and compose the data expected to tackle this issue; draw a photo; cross out unneeded data Number Sentence Write a number sentence to speak to the issue. Arrangement Sentence Write an answer sentence that clarifies your answer. Illustration: Ram purchased 6 baseball cards. The following day, he added 11 more cards to his accumulation. What number of cards does he have taking all things together? Steps Explanation Thought + Information 6 baseball cards, 11 baseball cards Number Sentence $6 + 11 =$ Solution Sentence Ram has 17 baseball cards in his gathering.

FAST DRAW Strategy (Mercer and Miller, 1992): FAST DRAW is another system used to take care of word issues. Here, understudies with LD are to be instructed each progression in the arrangement permitting adequate time for guided practice before asking them to autonomously execute the system. 4. Critical thinking Strategy (Birsh, Lyon, Denckla, Adams, Moats, and Steeves, 1997): Read the issue first. Highlight the question.

Circle the vital data. Build up an arrangement. Utilize manipulative to speak to the numbers. Execute the arrangement. Check your work. A few Techniques for Solving Calculation Problems 1. Various Representations: Beginning with the solid level and moving to the theoretical level, is a compelling method in helping battling students take care of figuring issues. The Concrete-Representational-Abstract (CRA) teaching succession has been found to enable understudies with LD to learn techniques and ideas. Concrete - utilize manipulatives (squares, unifix 3D squares, counters) to speak to numbers in the issue. Illustrative utilize count marks, pictures. Theoretical Numbers alone. 2. Demonstrate - Guided Practice - Independent Practice Sequence: Verbalize steps while demonstrating computations. Guide understudies while they tackle the issue and mediate as required. Allow understudies to freely take care of issues and after that do blunder investigation as required and give prompt input. Give the lined paper to understudies who experience issues with the arrangement of numbers. Draw a container around computations to enable understudies to separate one issue from another. Utilize bolts to show beginning stages. Utilize green imprints to show where to begin and red imprints to demonstrate where to end. Table – 3: FAST DRAW Strategy (Mercer and Miller, 1992) Steps Actions F Find what you're explaining for. An Ask yourself, "What are the parts of the issue?" S Set up the numbers. T Tie down the sign. D Discover the sign. R Read the issue. An Answer, or draw and check. W Write the appropriate response.

Procedures to Improve Mathematics Vocabulary Strategies that can enable understudies with LD to enhance their mathematics vocabulary incorporate (a) pre-show vocabulary, (b) mental aide methods, and (c) catchphrase approaches. These methodologies are just a couple of techniques accessible to help upgrade students' arithmetic vocabulary understanding. a) Pre-educate Vocabulary-

Utilize portrayals, both pictorial and cement, to stress the importance of math vocabulary. Pretest students' information of glossary terms in their math reading the material and instruct vocabulary that is obscure or erroneous. b) Mnemonic Techniques-Teach memory aide systems to help recall word implications. Utilize mental helper direction to enable understudies to enhance their memory of new data c) Key Word Approach-Use the watchword approach (e.g., imagine a visor as the catchphrase for). Divisor; picture quotes as the catchphrase for remainder Strategies to Address Difficulties Related to Algebraic Concepts Algebra is presented in primary school as understudies learn arithmetical thinking including examples, imagery, and portrayals.

Understudies with learning handicaps encounter trouble with polynomial math for different reasons incorporating trouble in understanding the vocabulary required for arithmetical thinking, challenges with critical thinking, and challenges in understanding the examples and capacities vital for mathematical thinking. The accompanying procedures can be received to address these difficulties: Teach key vocabulary required for polynomial math. Give models to recognizing and expanding designs. Show "verbally process" systems for understudies to fill in as cases for taking care of conditions and word issues.

Join the utilization of innovation (e.g., charting mini-computers) (Bryant, 2008). Lodging/Assistive Technology the University of Washington suggests the accompanying facilities for understudies with math learning inabilities. Math Specific Accommodations, The utilization of scratch paper to work out math issues amid exams. Talking adding machines. Fragmentary, decimal, and factual logical adding machines. PC Assisted Instruction (CAI) programming for math. PC Assisted Design (CAD) programming for the building. Substantial show screens for number crunchers and calculators. Different Accommodations that can Help Students with Math Learning Disabilities. Note takers. Audiotaped or recorded class sessions. Expanded exam time and a tranquil testing area. Visual, aural, and material exhibits fused into direction. Brief course and address plots. Recorded class materials.

Elective assessment strategies (e.g., portfolio, oral or video introductions). Giving tasks or nitty-gritty directions on audiotapes or print duplicates. Fortifying headings verbally. Breaking a lot of data or guidelines into little fragments. PCs outfitted with discourse yield, which features and peruses (through screen perusing programming and a discourse synthesizer) message on the PC screen. Word handling programming that incorporates electronic spelling and language structure checkers, programming with featuring capacities, and word expectation programming. Programming to expand screen pictures. Comprehensive Practices Learning inability is fundamentally an „invisible“ handicap. Understudies with learning trouble in math can be instructed in a comprehensive classroom alongside ordinary companions. The main thing that requirements to change are the way the instructor educates and runs the classroom. In the event that the understudies with learning challenges in math are not propelled or on the off chance that they don't get the backings they require, they will feel like a disappointment and afterward they will have something beyond a Math Problem taking care of the issue.

The accompanying is a few cases of changes that should be made to help the understudies with learning trouble to be effective in Inclusive Settings. Diminish rewards for people and reward the gathering, particularly for comprehensive practices. Urge every typical associate to be agreeable and supportive of the individuals who have the issue. The feature shared characteristics like qualities and most loved exercises among understudies.

Lead appraisal ceaselessly to know the understudies advance in class. Plan educational programs in a proper way with the goal that all can learn together.

Maintain a strategic distance from the negative disposition towards understudies with learning challenges. Encourage a feeling of incorporation by helping understudies with LD. Relegate classroom occupations and empower bunch exercises. Take after the standards of the general plan for learning. Give understudies selections of exercises or assignments. Additionally, this examination is fundamental that shows another application that was not overseen in past research concentrates, for instance, creative thinking gadgets to make imaginative thinking. And the results will give important information that may help in organizing instructive modules learning activities and arranging appropriate tasks for grade school staking in thought the need of making innovative thinking aptitudes in such essential stage. procedures/approaches and proposed numerous viable approaches to address the difficulties experienced by them in comprehensive settings.

Skillful instructors and different partners can assume the fundamental part in addressing the necessities of understudies with LD through comprehensive practices. Be that as it may, the aptitudes required to actualize such comprehensive practices (e.g., co-educating, separated guideline, peer-intervened adapting) likely set aside an opportunity to create. Thus, new methodologies and techniques must be created and previous methodologies and procedures are to be changed so as to address different learning challenges in science among understudies with learning handicaps in comprehensive set up. Furthermore, understudies with learning incapacities in arithmetic get advantage from the utilization of direct guideline in the methodologies to tackle word issues and to perform computations. Different systems, that fortify automaticity of fundamental realities, help to expand the general base of information of essential truth.

At long last, for critical thinking, computations and math familiarity propelled programming can be instrumental for understudies with learning disabilities

Using questioning to stimulate mathematical thinking. Great addressing procedures have for quite some time been viewed as a principal device of viable instructors and research has discovered that "distinctions in understudies' reasoning and thinking could be credited to the kind of inquiries that educators asked" (Wood, 2002, p. 64). Past research demonstrates that 93% of educator questions were "bring down request" learning construct questions centering in light of the review of realities (Daines, 1986). Plainly this isn't the correct sort of addressing to animate the numerical reasoning that can emerge from engagement in critical thinking and examinations. Shockingly, examine keeps on demonstrating that instructors make the couple of inquiries that urge kids to utilize higher request thinking abilities in science (Sullivan and Clarke, 1990). Numerous essential instructors have officially created impressive expertise in great addressing methods in educational programs regions, for example, proficiency and social investigations, yet don't exchange these abilities to arithmetic.

Educators' impulses regularly reveal to them that they should utilize investigational arithmetic all the more frequently in their instructing, yet they are once in a while disillusioned with the results when they attempt it. There are two regular explanations behind this. One is that the kids are unpracticed in this approach and think that it's hard to acknowledge obligation regarding the basic leadership required and require a ton of training to create composed or deliberate methodologies. The other reason is that the instructors still can't seem to build up a scrutinizing style that aides, underpins and fortifies the youngsters without expelling the obligation regarding critical thinking from the kids.

In view of this definition, Garofalo and Lester (1985) distinguished three kinds of metacognitive information identified with numerical critical thinking: individual learning; errand information; and system learning. Numerical individual learning incorporates "one's evaluation of one's own abilities and impediments" (p. 167). Numerical undertaking information incorporates "one's convictions about the subject of science and convictions about the idea of scientific errands" (p. 167). "Numerical system learning normally incorporates learning of calculations and heuristics, however, it likewise incorporates a man's consciousness of techniques to help appreciating issue explanations, sorting out data or information, arranging arrangement endeavors, executing designs, and checking comes about" (p. 168). The focal point of this examination is only on the numerical system learning part of metacognitive information.

Conclusion

Creative thinking is a complex mental activity which is directed by a strong desire to search for solutions or reach the original products were not known before. In addition, it is comprehensive, complex and consists of a set of skills such as fluency, flexibility, and originality.

The importance of creative thinking is that it helps in finding solutions to many problems. These solutions are organized, logical and sometimes outside the box and away from the routine ways in which they are imprisoned. Where pupils are due to traditional methods. In order to develop creative thinking in

mathematics, we must pay attention to everything that is new in the field of education, including the model of the creative solution to problems.

The researcher summarizes that there are many benefits of using the creative thinking in teaching mathematics:

1. It gives the Comprehensive and in-depth understanding of concepts, procedures, and relationships.
2. Increase knowledge of different sports topics.
3. Develop the ability to use mathematical terms studied, and integrate them to produce new knowledge.
4. Activate problem-solving strategies, such as trial and error, guessing, choosing the right view, and reflective thinking, thinking about thinking and changing data related to the problem.
5. Developing different thinking skills such as appreciation, finding alternatives and options, reflection, reflection and creative thinking.
6. Develop the ability to deal with open problems and unfamiliar situations.
7. Develop communication skills and work within teams.
8. Develop students' confidence in their ability to deal with aggressive mathematical situations

Recommendations

In the light of findings the following recommendations are presented:

1. It would be highly beneficial for the Ministry of Education. Additionally, this exploration is fundamental that exhibits another implimatation that was not overseen in past researchs, for instance, innovative thinking gadgets to make imaginative thinking, And the results will give profitable information that may help in orchestrating instructive modules learning activities and arranging appropriate tasks for grade school staking in thought the need of making creative thinking aptitudes in such essential stage.

2. The use of mathematical modeling in mathematics curricula to show the role of mathematical knowledge in the solution of real life problems.

3. Work on training students teachers in the faculties of education on how to use mathematical modeling in solving life problems.

4. Teachers work to discover the abilities and tendencies of students and develop their curiosity and work on developing these capacities in the right direction.

5. The curriculum makers should draw the attention of teachers to the importance of mathematical modeling to increase student motivation to study mathematics.

6. There should be a specialized team to choose the problems and activities that work to develop creativity

And include them in the mathematics curriculum in an appropriate manner that takes into account individual differences in students.

7. Included in the problems in the curriculum so that there are problems solved mentally and others.

8. Focus on the organization of the content of mathematics curricula in the primary stage according to mathematical modeling.

9. Preparation of guides for teachers to teach mathematics curricula in the primary stage using mathematical modeling

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